From: Zach First
Subject: ACC = Santa Claus
Date: 15 Mar 2000

While webcasting isn't quite ready for prime-time yet, I have some VERY exciting news to report: ACC is giving WHRC 1.5 megabits of bandwidth for webcasting streams. The webcast currently running is producing very good sound quality at approximately 28 kilobits per stream. This means that WHRC's server will be limited not to 10 streams, but to 53!

Once you begin listening to the webcast, you'll see the selection of QuickTime over Real and Windows Media beginning to bear some big fruit; QuickTime produces excellent sound quality at 28 kilobits/sec. This is a stream that can be received by someone using a typical 33.6 or 56k modem connection, and it produces sound quality far superior to Real and Windows Media at comparable settings. What is more, because we can get such good sound out of such a small stream, we can squeeze more streams into the bandwidth that ACC is giving the station, and hence you can get great sound and 53 simultaneous streams!

From: Zach First
Subject: Re: webcast, 2.0
Date: 16 Mar 2000

I'm not surprised that things were a bit choppy on an old 486 laptop. Most web programs these days would require a Pentium I as a minimum. Glad to know it worked, though.

I would be surprised if there weren't a computer in the studio sometime soon. The direction music is taking now (.mp3's, etc.) leads me to guess that in a few years (if not months) most college students will keep most of their music collection on their computer. Given the speed of the campus network, it would be fairly easy for people to assemble a playlist at home, arrive in the studio, and use the studio computer to play the music that resides on the hard drive in the their dorm room. I'd mention this to Sarah Craft and Jon Miller and see what their thoughts are (I imagine the main issue will be money more than anything else, unless the DOS Compatible PowerMac in the Prod Studio can handle mp3 playback...).

All of the computers that are in the production studio are at WHRC's disposal. The PC doesn't work, but the two Macs do. If you plan on using the PowerMac, you'll want to wipe the hard drive clean and install a new system on it because it is currently partitioned, with most of the space taken up by Linux, and the rest by system 7.5.

Yes, the G4 has been reconfigured to allow for up to 1.5 Mbits of bandwidth (I think I set the cap on streams at something like 57, but it should reach the bandwidth limitation before it reaches the 57 stream limit).

Yes, WHRC did used to "broadcast" to the DC. In fact, in the final few years of the old WHRC's life, when all the transmitters were broken, the only "broadcasting" it did was to the DC, for a few hours during Sunday brunch, and a few hours during dinner a couple of times/week. Again, I'd bring this up with the rest of WHRC's board to see what they think. If folks want to start using those speakers again (I think the DC had already contacted Sarah about getting WHRC's sound into the sunken lounge for something or other), it shouldn't be too hard to get them connected.

Don't forget to email Roger Hill (rhill@haverford.edu) - the A/V director - to talk to him about ordering a new tape deck, and anything else WHRC is planning to purchase.

From: Zach First
Subject: webcasting servers
Date: 21 Mar 2000

I have set up the Sorenson Broadcaster computer (the 6500) so that it will automatically restart itself every day at 5am. Whenever the computer starts up, it will automatically (via a small AppleScript) launch the Broadcaster application, open the WHRC settings, and begin broadcasting. Hopefully this will keep this server happy. (I believe that it will also have the added benefit of dropping every active connection at 5am, meaning that bandwidth hogs will, at the very least, be forced to actively reload their connection; folks shouldn't be able to take up one of the server's streams indefinitely. However, I might be wrong about this.)

From: Zach First
Subject: webcast: go public?
Date: 17 Mar 2000

Some occasioanl problems have cropped up during the webcast testing. However, they seem to mostly involve off-campus listeners, and I can't figure out what is the root cause. Given that I can't forsee testing improving the system much, I'm led to ask if now is the time to go public with the webcast. The decision is yours.

Whoever will be handling the set-up and maintenance of the webcasting stuff should contact me soon so that I can help them learn how to modify the "click this image to listen" image and the image that's included with the actual streaming movie (i.e., the frame that appears in the QuickTime player window while you're listening).

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I reformatted the hard drive on the DOS Compatible PowerMac 6100 in the Production Studio, and loaded Mac OS 8.5 on to it. Depending on what you think will make the most sense, you might want to load all the little programs (like Broadcast, etc.) from the Quadra 610 onto the PowerMac, then return that Quadra to the science library and let folks do their tooling around on a much faster machine (with the side benefit of clearing up some counter space, as well).

PS - You asked why, when you mouse over the button in the test web page that you click on to listen to the WHRC stream, the cursor doesn't turn into a little hand. The reason is that that image isn't actually a normal image that one would click on to open a link; it is a mini-QuickTime movie (with just 1 frame of video) that, when clicked, automatically launches the QuickTime player and begins the streaming process. The reason you use this method is so that the listener can't even attempt to access the link to the stream without the QuickTime plug-in installed (without that plug-in, the image obviously won't appear in the web page), and so that you can utilize the QT plug-in's capability of launching a movie within the Player, as opposed to within the web page.

From: Zach First
Subject: UPS
Date: 22 Mar 2000

FYI, the two webcasting computers are now plugged into a UPS (that's a combination surge protector and backup power supply) that will power the two machines for about 10 minutes in the event of a power outage. This will save you the headache of having to go down to the studio to reboot the machines manually every time the power goes out, but it won't save you from having to do this if the power goes out for much longer than about 10 minutes.

From: Zach First
Subject: final webcasting update
Date: 23 Mar 2000

This is, I hope, the final update on webcasting before you go public. After some tinkering, I've discovered that several computers that weren't able to receive the webcast now can due to one small change: I removed the image that was displayed in the QuickTime Player window while the audio stream was playing. By creating a streaming movie without an image in it, the computers I tested seemed to be much happier. While I realize this presents a less graphically pleasing experience, I think it's worth it to ensure higher compatibility.

If you find after testing the streaming page today that you are still having trouble, please let me know.

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If you find after testing the streaming page today that you are still having trouble, please let me know.

PS - The server log shows that there were 10 people listening over the web last night, and you all haven't even announced this thing yet. Good thing you've got 50+ streams to work with!

Date: 25 Mar 2000
From: Joshua L. Adelman
Subject: WHRC Webpage

Well after many hours and a lot of help from moby, belle & sebastian, Lauryn Hill and neutral milk hotel (to list just a few of the CDs I went through during the designing marathon these past 24hrs), I have completed the webpage. . . well almost. It's currently residing off of my own page, and (most importantly) the link to the quicktime audio isn't up. I need to meet with Zach to work one or two things out.

until then. . . . http://students.haverford.edu/jadelman/WHRC/whrc_online.htm

Everything else is there. I'm guessing it will take me about 1 or 2hrs to transfer all of the files to the WHRC site and change the file references. So it looks like we're on schedule if all goes as planned to be online by the middle of next week. In the mean time, take a look at the page and let me know what you think.

From: Zach First
Subject: webcasting failure
Date: 27 Mar 2000

Sometime this weekend the entire webcasting operation came to a screeching halt. I'm glad this happened right before you all take this thing public because it's a great learning experience. In short, here's all you need to know:

Both webcasting computers are set to automatically do everything that they need to do when they start up.

What this means is that, anytime the webcasting operation appears to be behaving strangely, someone just needs to go down to the studios and restart both machines. 9 times out of 10, this will fix the problem. In this particular case, some of the college's networking hardware went down over the weekend, and many campus network operations (including WHRC's webcasting) were affected. Once ACC fixed the problem this morning, both WHRC webcasting computers just needed to be restarted, and everything was hunky dory again. (FYI, I restarted both machines Sunday night, but because ACC hadn't fixed the problem over the weekend, restarting had no effect. As a general rule of thumb, restarting after 9am on a workday will yield the best results.)

Remember, when in doubt, restart. Vigilance is key here, folks, so next time something isn't working they way it should, take a few minutes to walk over to the studio to check it out.

From: Zach First
Subject: Re: webcasting failure
Date: 27 Mar 2000

All you need to do is restart both machines. That's it.

The only trick you need to know is that there is only one monitor for the two computers, so you'll need to un-plug and plug the monitor cable into the appropriate computer so that you can see the mouse on the screen in order to restart the machine.

The older Mac restarts just like any other Mac. The snazzy new Mac requires that you "Log Out" (this is a menu option under one of the menus in the Workspace Manager, which you access like any other program on the Mac: click on the right-most menu in the menu bar and you will see a list of all currently running programs; then select Workspace Manager), and then click the "Restart" button once the Log Out is complete.

From: Zach First
Subject: webcast changes
Date: 26 Apr 2000

In response to several issues that folks have raised over the past few weeks, I've been investigating and doing some tinkering with the webcast. I think I've made some progress:

1) sound quality: I jacked up the bit rate (ie., the number of kbits/sec that the stream uses) so that sound quality should be noticeably improved. I think this change will put listeners who are using dial-up internet connections right on the margin - 56k modem connections should be able to squeak by, but anything slower will probably drop out so frequently as to be unuseable. However, everyone else should see better sound quality all around.

2) choppy audio for off-campus listeners: As I've noted to several of you already, the college's internet connection is not the best in the world, so some choppiness is unavoidable. The good news is that I've discovered that by reducing the packet size, the situation can be improved, with some trade-offs (for those who care: a webcast stream consists of little bits of information - "packets" - that need to arrive in sequence for the audio to be clear and consistent; smaller packets - in this case, packet size has been reduced from 1500 bits to the minimum of 1025 bits - mean that a lost packet will be less noticeable as one listens, but also that there's more overhead involved in each little packet, thus reducing sound quality).

Remember, when in doubt, restart. Vigilance is key here, folks, so next time something isn't working they way it should, take a few minutes to walk over to the studio to check it out.

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In my initial testing, I've found that off-campus audio quality is much better with the smaller packets, with far fewer short lapses in the stream. However, I've also found that on-campus audio now wavers a little bit, largely because the webcast is now using smaller packets at the same time that the overall stream bitrate has been increased (see #1 above). What this has resulted in to my ears is an occasional lessening of audio quality, but nothing more severe than that.

The bottom line: with "webcast 2.0" now running, the problems of old seem to have been just about 75% fixed. Overall sound quality is a little better, sound drop-outs are less common. Please give the webcast a listen, and see if you can get some of your off-campus friends to tune in one more time for an update on how we're doing.

Date: 10 Oct 2000
From: Zach First
Subject: webcasting update

Woops...as soon as I sent you that email, I just noticed that Apple has released a new version of QuickTime (http://www.apple.com/quicktime/preview/qtss.html). It's still a preview version, so you may not want to mess with it, but the new QuickTime Streaming Server has a "skip protection" feature that more intelligently buffers data to help avoid skipping on the listener's end.

Installing and configuring new programs on Mac OS X Server is, however, pretty ugly. (For what it's worth, I had to resort to the command line interface.) You would do well to upgrade the G4 box to Mac OS X once it's been released. Hell, if you've got a copy of the public beta of OS X, you could just load that on the machine and put the beta of the new QT Streaming Server on top of it...but that might be just a bit too Rube-Goldberg for comfort (beta + beta could equal disaster, although Apple mentions this set up - OS X beta + beta of new QuickTime server - as the preferred set up).

Anyway, you'll want to budget for purchasing a copy of Mac OS X once it's released in the spring, and keep an eye on what's going on with the new QuickTime Server software, as it could improve your service.

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The webcasting software comes in two parts:

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2) Sorenson Broadcaster, running on the clunky Performa, performs the actual digital encoding of the station's audio signal. There should be a Broadcaster box (with a manual inside) on the shelves behind the desk that has the iMac on it. If there's nothing there, you can always go to http://www.sorenson.com/SorensonBroadcaster/overview.html and check out the various tutorials, FAQ's, etc. that they have online.

Broadcaster will definitely need to be reconfigured once multicasting has been enabled. Again, I unfortunately can't tell you exactly what you'll need to do, but I don't think it'll be too terribly complicated.

Date: 11 Oct 2000
From: Zachary First
Subject: Re: WHRC!!

I know what you mean about the audio quality artifacts (tinny sound, as if from the bottom of a well, etc.) that show up on the webcast. When the past tech director and I selected QuickTime as the platform of choice, we evaluated its sound quality against that of RealAudio and Windows Media Player. While there is no substitute for listening for yourself, I can tell you what we found: there are certainly RealAudio and WMP audio files out there that sound better than the WHRC webcast, but there is a catch: these files are not live audio. Any audio that isn't streamed live can be tweaked depending on its particular qualities. This is true with QuickTime as well: you can find QT files on the web that have great audio quality, better than what WHRC is getting, but they aren't live.

Live streaming requires that you choose a more-or-less generic compression scheme and stick with it no matter what's coming over the line. I tried to pick the best possible general settings, although there is an emphasis on music over voice quality in the current webcast. If you can find a live audio stream that is using as little bandwidth as the QT technology and producing better audio quality, then I see no reason not to think about converting to a different digital audio set up.

FYI, the various quality settings for the webcast are set in Sorenson Broadcaster, so you can tweak stuff and see what it does to the sound quality. I left most of the settings in the high end of quality, but you may find that eating up a bunch more bandwidth for slightly better quality is a good route given what your listeners want.

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